Geol 588

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GIS for Geoscientists II

Lecture 1

Today

- Syllabus (also on WebCT)
- What are your background & interests?
- Using the GIS lab's Delphi server
- WebCT
- Making screenshots with Printscreen
- Loading data into ArcGIS

Syllabus

- Full syllabus on WebCT

- Format: Lecture + Lab (exercises)

- Lecture may include "follow along" activities

- Thu.: 1 hr lecture, pause, 1 hr lab

- Tue. 2 hr lab (with pause)

- No text book (Arc pdf manuals are online)

- Start with chapter 15 of Mastering ArcGIS *

- Homework assignment / exercise (20 - 30 pts)
  - practice the material covered in the lecture
  - 2 - 3 tasks (possible some questions)
  - 10 points per task:
    - 1-5 points for quality of the solution
    - 1-5 points for quality of documentation (detail of description, number of screen shoots, etc.)
- Work on graded exercises:
  - during lab times (Tue 3-4, Thurs 2-4) - I'm available for help, questions, etc.
  - on your own time (if you need more time) - see GIS lab schedule at door

- Quiz:
  - 2 quizzes: open book (notes), test theory
  - 20 min to answer 3 of 4 questions (write text)
- Midterm, Final exam (open book)
  - Multiple Choice part (15 min.)
  - Practical part (90 min. - should only need 60 min.)
- Class (final) project (last 3 weeks)
  - poster (only electronic form needed!)
  - 10 min. oral presentation (10 powerpoint slides)
  - Material up to you (your research?), start early!

- Total Grade:

  - graded (homework) assignments) 30%
  - quizzes: 10%
  - midterm: 20%
  - class project (includes oral presentation): 15%
  - final Exam: 15%
  - class participation 10%

Topics covered

- raster data concepts (general)
- types of rasters: ESRI Info grids, images, DEMs, satellite img., int vs. float vs. categories
- raster analysis setup (temp/perm rasters, mask, env., raster information)
- using the ModelBuilder interface (ArcToolbox)
- raster symbolization (color-ramp, stretching, classified, histogram)
- raster import/export/conversion: vector data, TIN, raster file types (geotiff, grid, ASCII)
- map algebra/Raster Calculator (boolean overlay, mask, NoData)

- cell statistics (map stack math)

- neighborhood stats (moving kernels)

- zonal (summary) statistics

- distance analysis (straight line, least-cost-path) Interpolation (IDW, natural neighbors, Spline)

- Terrain (surface) analysis: slope, azimuth, contour, cut-fill, viewshed, observer points, hillshade

- Volume/thickness analysis

- Suitability analysis

- Geo referenceing

- Optional topics - we can do 2 to 3 of these, depending on your interest:

  - Hydrological analysis: flow direction, accumulation, watershed delineation

  - ArcScene (3D visualizer)

  - Triangle network data (TIN)

  - Geostatistics (Kriging) (complex)

 - Python scripting

- Question about syllabus?

Your background & interests

- Name ?

- Major ?

- Advisor ? Thesis project ?

- Prior GIS involvement ?

- Why are you taking this course ?

Access to GIS server (delphi)

Map \\delphi\geol588 as network drive

- My Computer > Tools > Map Network Drive
- Drive: X
- Folder: \\delphi\geol588
- Login with ISU id and password
- Sometimes you need to use: \\delphi.gis.iastate.edu\geol588 and/or IASTATE\<netID>
- Alternative: File Manager Address: \\delphi\geol588
- Always needed before starting Arc!
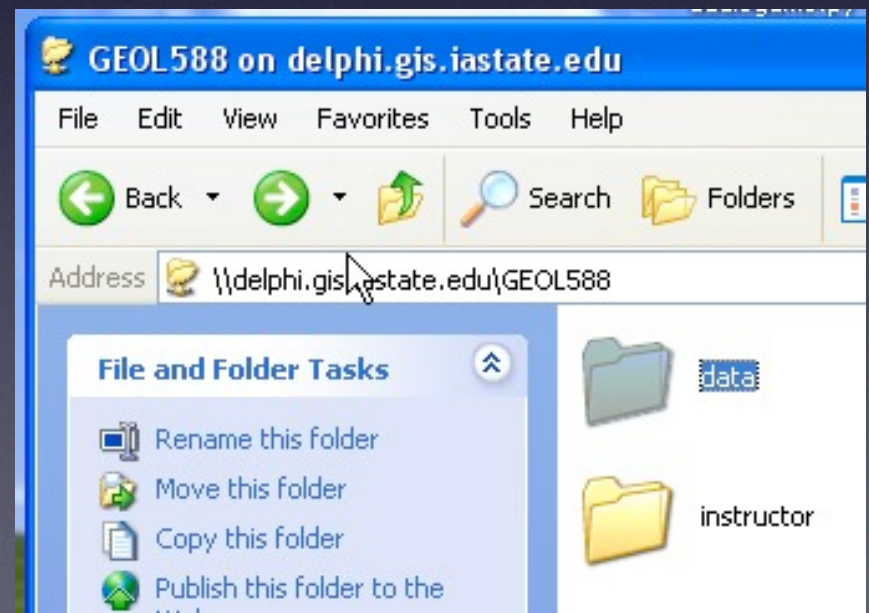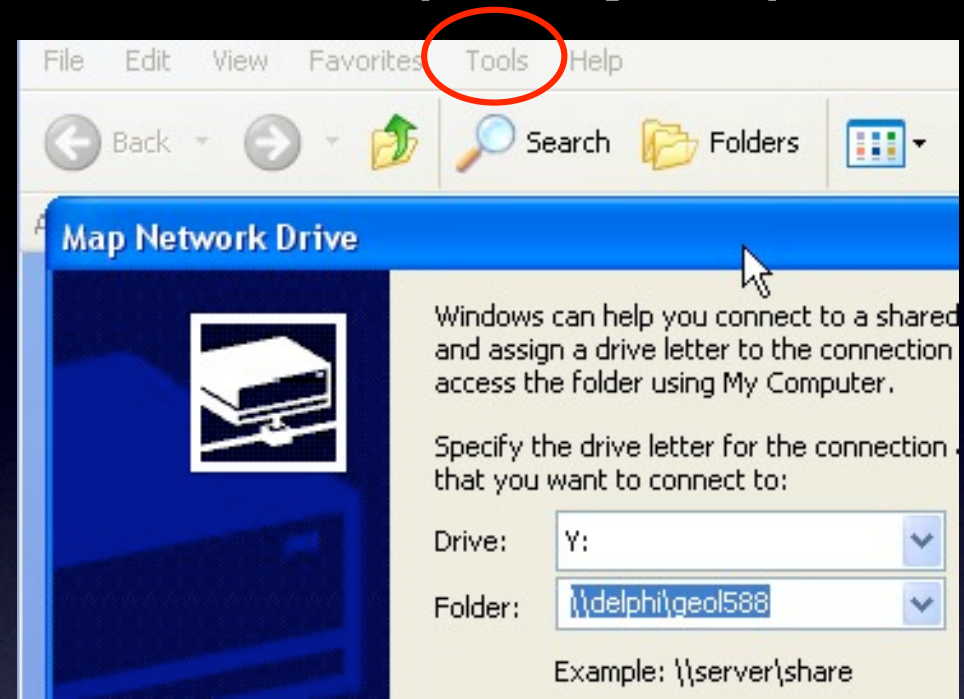
- Gadwin printscreen demo (for making jpgs and pasting them into Word, use for homework!)

- Try WebCT, connecting to delphi

- Run ArcMap with Spatial Analyst extension and load some data

- Create "Remote connection" to geol588 in ArcMap

- data\MGIS_ch_15_data\BlackHills\

- Until next session:
  read p. 523 - 532 in Chapter 15, Mastering ArcG
  (WebCT: GIS materials folder)

  - (this book if for ArcGIS 9.2 but we will use 9.3)